

Soil Map and Tests

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According to the [Web Soil Survey](#) website, the soil on the site is PDC, or Pavant-Doyce complex, 2 to 8 percent slopes. From what I can understand, Pavant is at 4-8% slope, and Doyce is at 2-4% slope.

1. The site's farmland classification is: Not prime farmland
2. The site's typical profile is:

Pavant:

Ap - 0 to 7 inches: loam

C₁ - 7 to 13 inches: clay loam

C_{1ca} - 13 to 17 inches: clay loam

C_{2cam} - 17 to 29 inches: indurated

Doyce:

A₁ - 0 to 10 inches: loam

B_{2t} - 10 to 20 inches: sandy clay loam

C_{1ca} - 20 to 32 inches: sandy clay loam

C_{2ca} - 32 to 44 inches: stony sandy clay loam

C₃ - 44 to 48 inches: loam

C_{4cab} - 48 to 60 inches: stony loam

3. The site's drainage is:

Pavant: 10 to 20 inches to petrocalcic

Doyce: More than 80 inches

4. The site's depth to bedrock or restrictive feature is: More than 80 inches
5. The site's depth to water table is: More than 80 inches

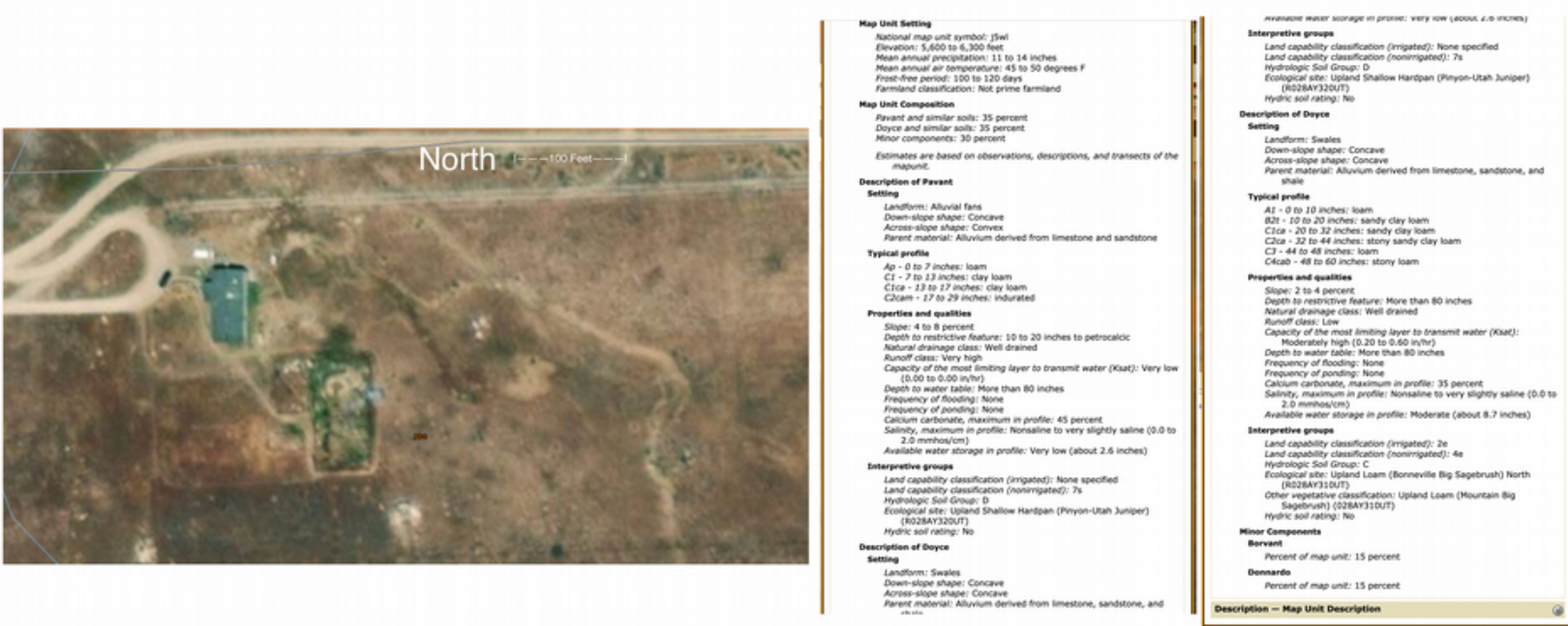
6. The frequency of flooding is: None

7. The available water storage in profile is:

Pavant: Very low (about 2.6 inches)

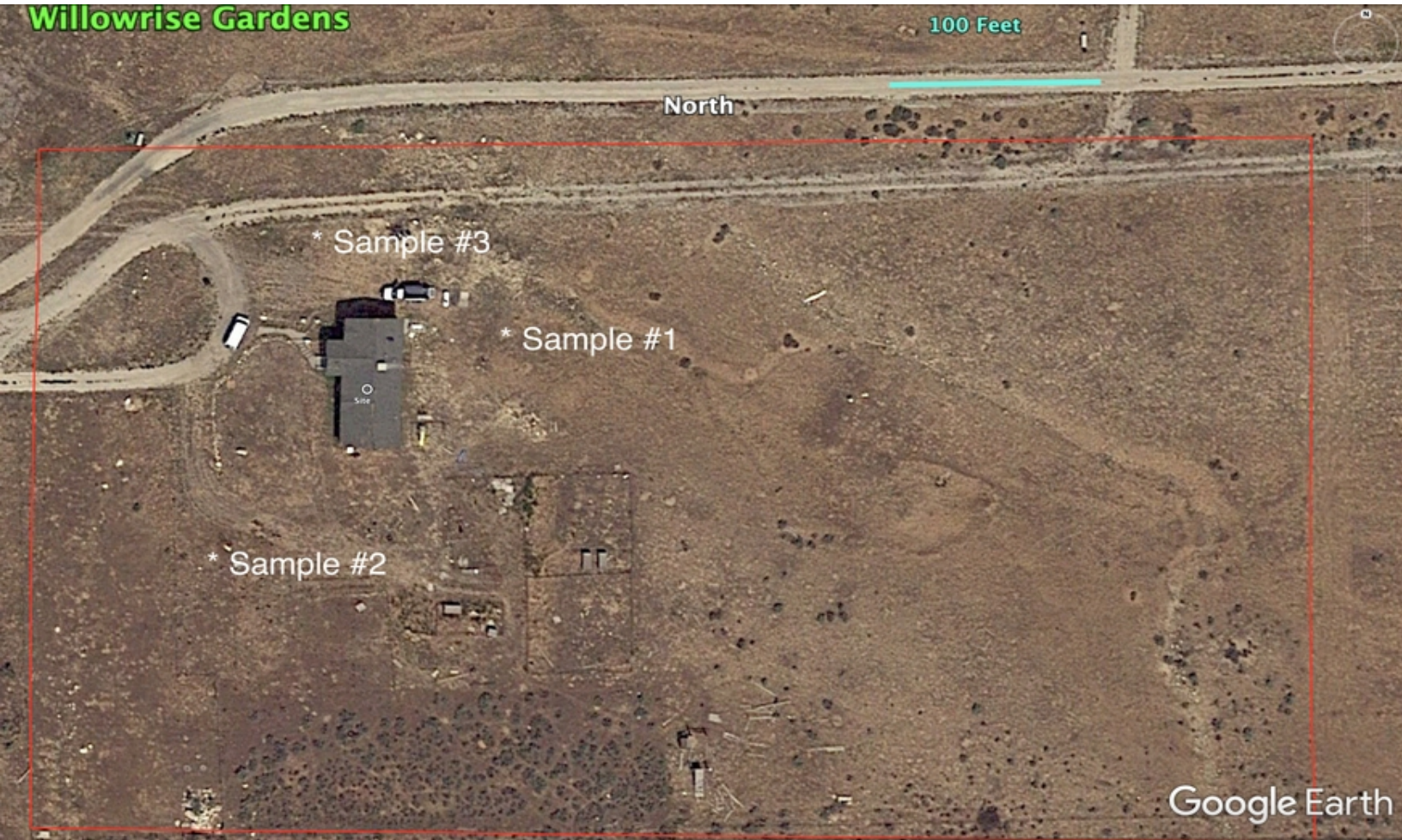
Doyce: Moderate (about 8.7 inches)

8. The hydric soil rating is: No



Soil Samples

Willowrise Gardens



(Samples taken at the asterisks)

Jar Test



Soil 1: From a north-facing side of an on-contour ditch, which was dug two years ago.



3.25 cm total

Clay: 1.25 cm, 38.5%

Silt: 2cm, 61.5%

Sand: None detected. I was puzzled by this, so I got another sample and ran the test again, with the same result.

Soil 2: From a pen temporarily used as a goat pen.



2.25 cm total

Clay .45 cm, 20%

Silt .55 cm, 24.5%

Sand 1.25 cm (very fine sand), 55.5%

Soil 3: From right next to the woodpile, otherwise undisturbed.



2.375 cm total

Clay .775 cm, 33%

Silt .6 cm, 25%

Sand 1 cm (very fine sand), 42%

Hand-Ribbon Test



For each of my soil samples, I also molded a little sculpture... for fun.

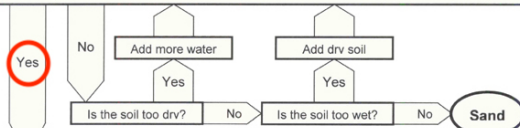
1. From a north-facing side of an on-contour ditch, which was dug two years ago.



Soil Texture by Feel

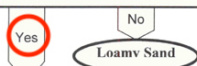
Start: Place soil in palm of hand. Add water drop-wise and knead the soil into a smooth and plastic consistency, like moist putty.

Does the soil remain in a ball when squeezed?



Place ball of soil between thumb and forefinger, gently pushing the soil between with the thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow ribbon to emerge and extend over the forefinger, breaking from its own weight.

Does the soil form a ribbon?



What kind of ribbon does it form?

Moisten a pinch of soil in palm and rub with forefinger	Forms a weak ribbon less than 1" before breaking	Forms a ribbon 1-2" before breaking	Forms a ribbon 2" or longer before breaking
	LOAM	CLAY LOAM	CLAY
Does it feel very gritty?	Yes Sandy Loam	Sandy Clay Loam	Sandy Clay
Does it feel equally gritty and smooth?	Yes Loam	Clay Loam	Clay
Does it feel very smooth?	Yes Silt Loam	Silty Clay Loam	Silty Clay

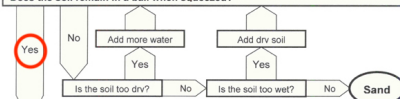
2. From a pen temporarily used as a goat pen.



Soil Texture by Feel

Start: Place soil in palm of hand. Add water drop-wise and knead the soil into a smooth and plastic consistency, like moist putty.

Does the soil remain in a ball when squeezed?



Place ball of soil between thumb and forefinger, gently pushing the soil between with the thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow ribbon to emerge and extend over the forefinger, breaking from its own weight.

Does the soil form a ribbon?



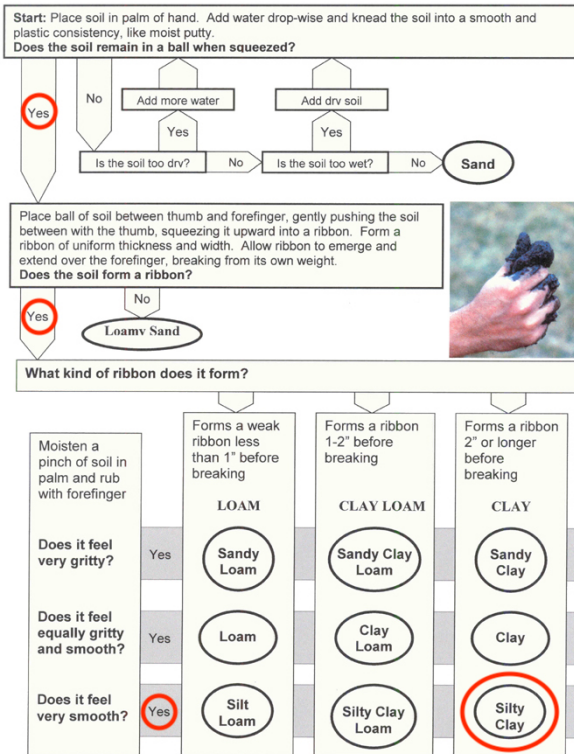
What kind of ribbon does it form?

Moisten a pinch of soil in palm and rub with forefinger	Forms a weak ribbon less than 1" before breaking	Forms a ribbon 1-2" before breaking	Forms a ribbon 2" or longer before breaking
	LOAM	CLAY LOAM	CLAY
Does it feel very gritty?	Yes Sandy Loam	Sandy Clay Loam	Sandy Clay
Does it feel equally gritty and smooth?	Yes Loam	Clay Loam	Clay
Does it feel very smooth?	Yes Silt Loam	Silty Clay Loam	Silty Clay

3. From right next to the woodpile, otherwise undisturbed.



Soil Texture by Feel



Percolation Test

With the perc test, I filled the holes, waited, and got the measurements after an hour, and it wasn't until the next day (Monday) that I realized I was supposed to take a *photo* with the ruler at the hour. Oops. But I took a photo of each anyway.

1. Started at 12:32 : measured at 1:32 – 4.25 inches



2. Started at 12:38 : measured at 1:38 – 5.5 inches



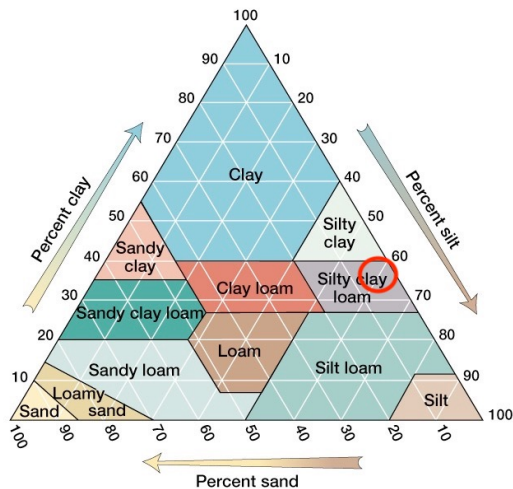
3. Started at 12:46 : measured at 12:46 – 4.5 inches



Soil Profile

Photo of each sample area is included in the percolation test. But here are the soil texture pyramids for each.

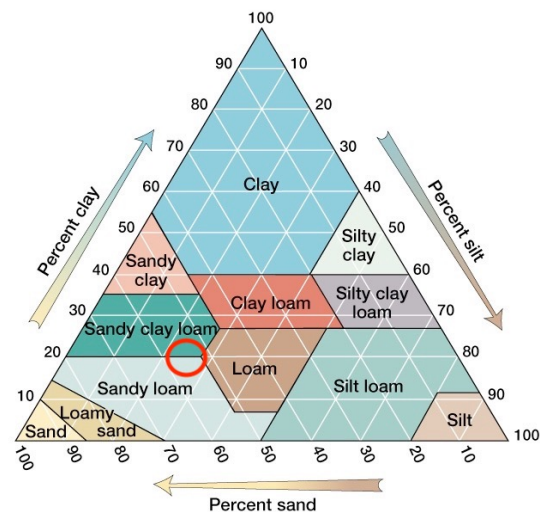
1. From a north-facing side of an on-contour ditch, which was dug two years ago.



This soil is next to a swale I dug two years ago, but have otherwise neglected. The only organic material on the spot is what little grass and dry wild plants grow without maintenance. The area is infrequently played on by kids.

According to the results of my jar test, this is silty clay loam.

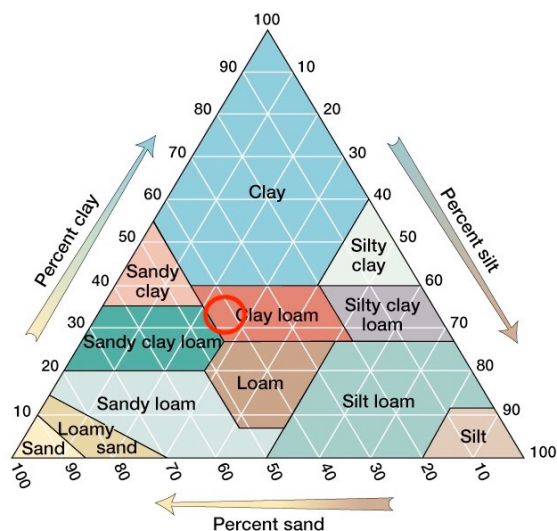
2. From a pen temporarily used as a goat pen.



We had goats for 4-5 months, but sold them about a month or two ago. This soil is from the pen they lived in. The area was otherwise ignored, so wild grass and weeds tend to grow in the area.

According to the results of my jar test, this is sandy clay loam/sandy loam.

3. From right next to the woodpile, otherwise undisturbed.

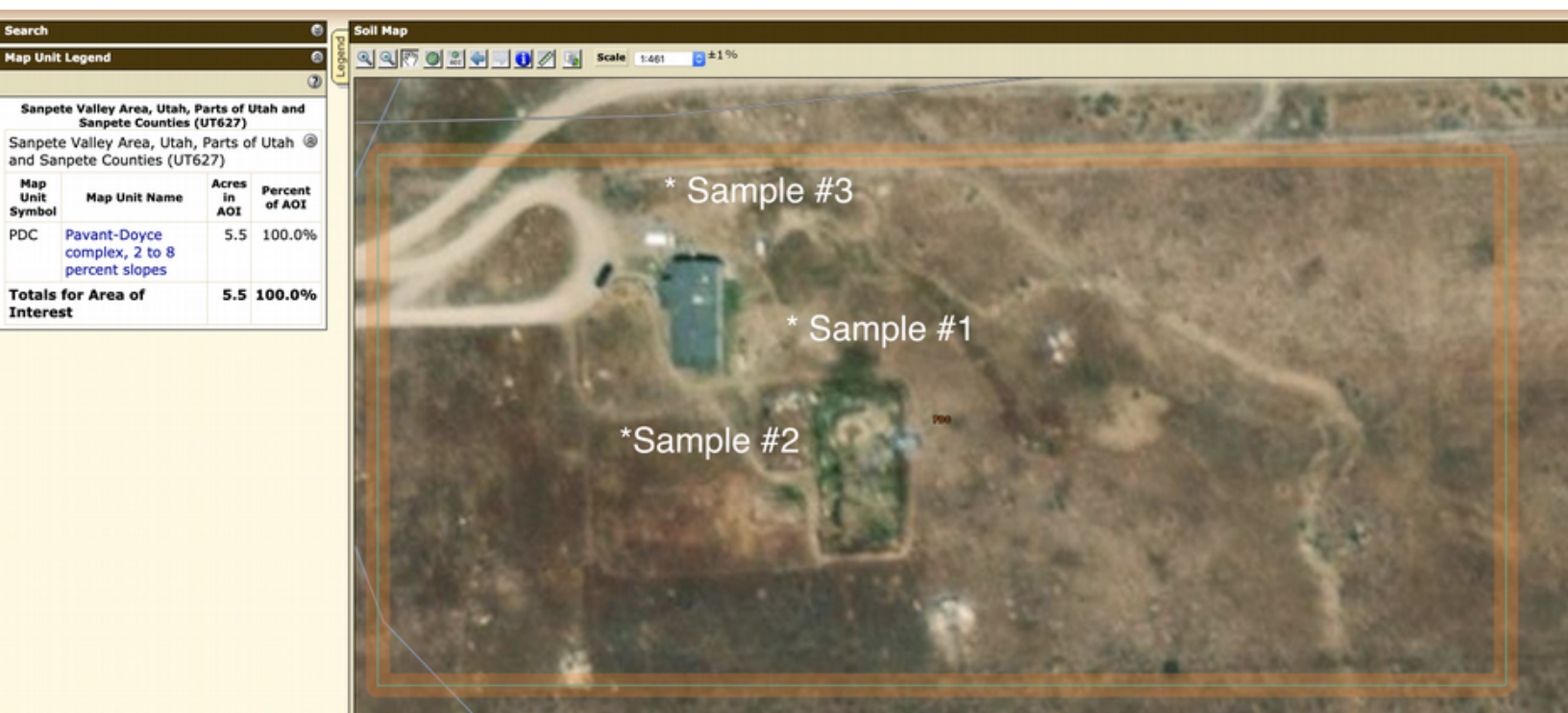


Our woodpile collection, mostly from neighbors and strangers dropping off pruned branches and trees lays out in an otherwise ignored area of the property. This hole is not in the woodpile, but right next to it. Wild grass and dry, neglected meadow area.

According to the results of my jar test, this is clay loam.

Narrative Summary

Soil Map:



(asterisks indicate specific location of sample)

1. The Web Soil Survey map lists the soil of the site as *loam*, or *clay loam*. This doesn't directly correlate with the results of my first two jar tests, which listed my soils as silty clay loam and sandy clay loam, but it did result in the same type in the third jar test, clay loam. Since sample #3 is likely the most undisturbed area of the samples, I suppose it makes sense that the different result may be because the other two areas have had some disturbance in the last few years. One from the digging of the swale, and the other from goats.

The ribbon test had different results. The first two tested as silty clay loam, which matches the result of my first jar test, but the last listed as silty clay. So either I'm not getting an accurate result with my sandy clay loam (very possible, since the sand in the jar sample is a really, really fine sand), or the ribbon test is only mostly accurate. The ribbons came out just barely longer than 2 inches. Otherwise they would have resulted in silty clay loam, like the other two.

Overall, I think it may be fair to suspect that most of the soil on the site (untreated soil, anyway) is clay loam and silty clay loam.

2. My clay loam and silty clay loam should be good at holding nutrients, and may do better than sandy soils at retaining water. I will have to be careful about drainage, as the soil may struggle to sufficiently drain water when it comes in abundance. I've noticed this trend after the snow melts. Water runs down dirt roads and bare land like a stream, and if the soil becomes compacted, it's very difficult for plants to penetrate the soil. This might be helped with good pioneer species where soil is compacted.
3. We have good access to branches, leaves, and wood particles. Planned right, we should be able to add considerable humus by covering the soil with sticks, wood-chips, leaves, and dried grass/hay. These would also help retain some of the moisture at the soil level after a rain/snowstorm where the ground tends to get especially dry.

Breakdown of the major soil-types on the property:

Clay Loam: A very clay-centered soil, which makes it good for holding nutrients and water for plants, but it may struggle at getting good drainage for those plants. It can be good for pond construction. When it gets wet, it tends to expand, but then shrink as it dries.¹ This helps aerate the soil/roots, but makes it incredibly mucky to walk through when wet.

My observation is that in the spring, when snow has melted, and the immediate surface has dried, this soil sits waiting to crumble and sponge in when stepped on. If compaction (such as stepping) can be avoided, this texture gives the soil a good opportunity to grow plants well. But if compacted, it can quickly become hard-packed and dusty.

Silty Clay Loam²: Like clay loam, it's fairly good at retaining water and nutrients, and though it struggles some with drainage, it does better than clay loam, and is therefore better for growing plants. Silty clay loam is also improved using compost, mulch, and other forms of added humus.

¹ <http://www.southernmulch.com/article-what-is-clay-loam.php>

² <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/silty-clay>